

Appl. No. 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 1. (Currently Amended) An apparatus for pumping and sterilizing or
2 disinfecting liquid held in a reservoir, comprising:
3 a fluid conduit, which is at least partially submerged in the liquid held in the
4 reservoir;
5 a ultraviolet light source which is at least partially within the fluid conduit, the
6 ultraviolet light source comprising a ~~protective sleeve surrounding at least a portion of the~~
7 ~~ultraviolet light source~~ protective coating surrounding and in touching proximity with at least a
8 portion of the ultraviolet light source, the protective coating hermetically sealing the ultraviolet
9 light source, the protective coating having properties that allow the germicidal energy to pass;
10 ~~and and protecting the ultraviolet light source from breaking; and~~
11 an air drive unit coupled to the fluid conduit and adapted to cause a liquid to flow
12 through the fluid conduit and past the ~~at least a portion of the ultraviolet light source in the fluid~~
13 conduit, wherein said ultraviolet light source generates an ultraviolet light which kills
14 microorganisms in the liquid and said fluid conduit.
- 1 2. (Previously Presented) The apparatus as recited in claim 1, wherein said
2 ultraviolet light source comprises a casing for holding a gas and a vaporizable material, and at
3 least one electrode electrically coupled to a power source for exciting said gas and said
4 vaporizable material.
- 1 3. (Currently Amended) The apparatus as recited in claim 2, wherein said
2 protective sleeve coating comprises a UV transmissive material.
- 1 4. (Currently Amended) The apparatus as recited in claim 3, wherein said
2 protective sleeve coating is a fluoropolymer sleeve coating.

Appl. No. 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004,

PATENT

1 5. (Original) The apparatus as recited in claim 2, wherein said casing
2 comprises a fluoropolymer casing.

1 6. (Currently Amended) The apparatus as recited in claim 4, wherein said
2 casing comprises a quartz or glass casing and said fluoropolymer sleeve coating surrounds said
3 quartz or glass casing.

1 7. (Currently Amended) The apparatus as recited in claim 3, wherein said
2 protective sleeve coating comprises a silicon polymer or silicone material.

1 8. (Currently Amended) The apparatus as recited in claim 4, wherein said
2 fluoropolymer sleeve coating is made from a fluoropolymer selected from the group of
3 fluoropolymers including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 9-12. (Cancelled)

1 13. (Currently Amended) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve coating is heat shrunk around said quartz or glass casing of said ultraviolet
3 light source.

1 14. (Currently Amended) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve coating is form pressed around said quartz casing of said ultraviolet light
3 source.

1 15. (Currently Amended) The apparatus as recited in claim 6, wherein said
2 fluoropolymer sleeve coating is formed around said quartz or glass casing of said ultraviolet light
3 source by dipping said ultraviolet light source into a liquid material.

1 16. (Currently Amended) The apparatus as recited in claim 1, further
2 comprising a power source, wherein said power source is a solar power source connected to said
3 ultraviolet light source, and wherein said protective sleeve coating surrounds said solar power

Appl. No. 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004.

PATENT

4 source and said ultraviolet light source and hermetically seals said solar power source with said
5 ultraviolet light source.

1 17. (Currently Amended) The apparatus as recited in claim 1, wherein said
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated
3 body portion formed between said first end portion and said second end portion, and wherein
4 said protective sleeve comprises a fluoropolymer sleeve coating covering at least a portion of
5 said elongated body portion and first and second end caps covering said first and said second end
6 portions, respectively, and forming a seal with the fluoropolymer sleeve coating.

1 18. (Original) The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

1 19. (Original) The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise silicone end caps.

1 20. (Currently Amended) The apparatus as recited in claim 17, wherein said
2 first and said second end caps are sealed to said protective sleeve coating using a silicone sealer.

1 21. (Cancelled)

1 22. (Currently Amended) A method of pumping and sterilizing or disinfecting
2 a liquid held in a reservoir, comprising the steps of:

3 positioning a fluid conduit at least partially submerged in the liquid held in the
4 reservoir;

5 placing an ultraviolet light source at least partially within the fluid conduit, the
6 ultraviolet light source comprising a ~~protective sleeve surrounding at least a portion of the~~
7 ~~ultraviolet light source~~ a protective coating surrounding and in touching proximity with at least a
8 portion of the ultraviolet light source, the protective coating hermetically sealing the ultraviolet
9 light source, the protective coating having properties that allow the germicidal energy to pass;
10 ~~and preventing the ultraviolet light source from breaking;~~

Appl. No. 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004,

PATENT

11 pumping air into the fluid conduit to pump liquid through the fluid conduit and
12 past at least a portion of the ultraviolet light source; and
13 illuminating said ultraviolet light source so that an ultraviolet light is generated,
14 killing microorganisms in the liquid and said fluid conduit.

1 23. (Original) The method as recited in claim 22, wherein said ultraviolet
2 light source comprises a casing for holding a gas and a vaporizable material, and at least one
3 electrode electrically coupled to said power source for exciting said gas and said vaporizable
4 material.

1 24. (Currently Amended) The method as recited in claim 23, wherein said
2 protective sleeve coating is a fluoropolymer sleeve.

1 25. (Original) The method as recited in claim 23, wherein said casing
2 comprises a fluoropolymer casing.

1 26. (Currently Amended) The method as recited in claim 24, wherein said
2 casing comprises a quartz or glass casing and said fluoropolymer sleeve coating surrounds said
3 quartz or glass casing.

1 27. (Currently Amended) The method as recited in claim 24, wherein said
2 fluoropolymer sleeve coating is made from a fluoropolymer selected from the group of
3 fluoropolymers including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 28. (Currently Amended) The method as recited in claim 23, wherein said
2 protective ~~sleeve~~ coating comprises a silicon polymer or silicone material.

1 29. (Cancelled)

1 30. (Currently Amended) The method as recited in claim 22 , wherein a
2 protective sleeve coating comprises a removable container.

1 31. (Cancelled)

Appl No 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004,

PATENT

1 32. (Cancelled)

1 33. (Currently Amended) The method as recited in claim 26, wherein the
2 fluoropolymer sleeve coating is heat shrunk around said quartz or glass casing of said ultraviolet
3 light source.

1 34. (Currently Amended) The method as recited in claim 26, wherein the
2 fluoropolymer sleeve coating is form pressed around said quartz or glass casing of said
3 ultraviolet light source.

1 35. (Currently Amended) The method as recited in claim 24, wherein said
2 fluoropolymer sleeve coating is formed around said quartz or glass casing of said ultraviolet light
3 source by dipping said ultraviolet light source into a fluoropolymer liquid material.

1 36. (Currently Amended) The method as recited in claim 22, wherein said
2 power source is a solar power source connected to an ultraviolet light source, and wherein a
3 protective sleeve coating surrounds said solar power source and said ultraviolet light source and
4 hermetically seals said solar power source with said ultraviolet light source.

1 37. (Currently Amended) The method as recited in claim 22, wherein a
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated
3 body portion formed between said first end portion and said second end portion, and wherein
4 said protective sleeve comprises a fluoropolymer sleeve coating covering at least a portion of
5 said elongated body portion and first and second end caps covering said first and said second end
6 portions, respectively, and forming a seal with the fluoropolymer sleeve coating.

1 38. (Original) The method as recited in claim 37, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

1 39. (Original) The method as recited in claim 37, wherein said first and said
2 second end caps comprise silicone end caps.

Appl. No. 09/619,520
Amdt. dated February 24, 2005
Reply to Office Action of August 25, 2004,

PATENT

1 40. (Currently Amended) The method as recited in claim 37, wherein said
2 first and said second end caps are sealed to said protective ~~sleeve~~ coating using a silicone sealer.

1 41. (Cancelled)

1 42. (Cancelled)